

### **REMARKS**

Favorable reconsideration of the application is respectfully requested in light of the amendments and remarks herein.

Upon entry of this amendment, claims 1-48 will be pending. By this amendment claims 1 and 25 have been amended. No new matter has been added.

#### **Objections to the Drawings**

In Section 1 of the Office Action, the Examiner has objected to Figure 8 for failing to indicate it as being Prior Art. Figure 8 has been amended, obviating the objection. Accordingly, it is respectfully requested that this objection be withdrawn.

#### **Objections to the Specification**

In Section 2 of the Office Action, the Examiner has objected to the Specification. The claims have been amended, thereby obviating the objection. Accordingly, it is respectfully requested that this objection be withdrawn.

#### **Objection to Claims 1-48**

In Sections 3 of the Office Action, the Examiner has objected to claims 1-48 because of informalities. Relevant claims 1 and 25 have been amended, obviating this objection. Accordingly, it is respectfully requested that this objection be withdrawn.

§112 Rejection of Claims 1-48

In Sections 4-6 of the Office Action, the Examiner has rejected claims 1-48 under 35 U.S.C. § 112, first and second paragraphs. Claims 1 and 25 have been amended, thereby obviating this rejection. Accordingly, it is submitted that the Examiner's rejection of claims 1-48 based upon 35 U.S.C. §112 has been obviated and withdrawal thereof is respectfully requested.

§ 102 Rejection of Claims 1-3, 14, 25-27 and 38

In Section 8 of the Office Action, the Examiner has rejected claims 1-3, 14, 25-27 and 38 under 35 U.S.C. §102(e) as being anticipated by Van Stralen *et al.* (U.S. Patent 6,304,996 B1; hereinafter referred to as "Van Stralen").

Independent claims 1 and 25, as presented herein, recite a decoder and a decoding method for "obtaining at least two paths of getting to a decoding state from at least three paths, and for selecting a maximum likelihood path from said at least two paths, wherein a log likelihood of getting to a state in the decoder is determined by an input value from an encoder encoded with a trellis so as to provide at least three paths for getting to the decoding state, said input value received through a communication channel having noise such that said input value is regarded as being a soft value." *Claims 1 and 25 (emphasis added)*. Figure 8 illustrates the disclosed trellis used for encoding.

In Sections 2, 4, and 5 of the Office Action, the Examiner indicated that the trellis of Figure 8 is used for assigning hard values to information bits during convolutional encoding. Although the encoder outputs "hard" values, the decoder may treat the encoded values transmitted through a communication channel having noise as "soft" values. This is disclosed in the Specification in describing Figure 9, "[t]he decoder 3 estimates the input data  $i_t$  of the

encoder 1 by determining the log soft-output  $l\lambda_{2t}$  from the received value  $y_t$  showing an analog value under the influence of the noises generated on the memoryless communication channel 2 and hence regarded as soft-output.” *Specification, page 25, lines 16-20*. Therefore, the decoder of claim 1 and the decoding method of claim 25 provide higher likelihood than the conventional decoder and method of getting to a decoding state by treating the input value from the encoder as a “soft” value encoded with a trellis (e.g., as shown in Figure 8).

Van Stralen, however, fails to teach or suggest a decoder or a decoding method where the log likelihood of getting to a state in the decoder is determined by an input value encoded with a trellis so as to provide at least three paths for getting to the decoding state, and where the input value is received through a communication channel having noise such that the input value is regarded as being a soft value.

Based on the foregoing discussion, it is submitted that claims 1 and 25 are not anticipated by the teachings of Van Stralen. Accordingly, since claims 2-3 and 14, and 26-27 and 38 depend from claims 1 and 25, respectively, it is submitted that the Examiner’s rejection of claims 1-3, 14, 25-27, and 38 based upon 35 U.S.C. §102(e) has been overcome by the present remarks and withdrawal thereof is respectfully requested.

#### § 103 Rejection of Claims 4, 5, 15-24, 28, 29, and 39-48

In Section 9 of the Office Action, the Examiner has rejected claims 4, 5, 15-24, 28, 29, and 39-48 under 35 U.S.C. §103(a) as being anticipated over Van Stralen in view of Benedetto *et al.* (S. Benedetto, D. Divsalar, G. Montorsi, and F. Pollara, Soft-Output Decoding Algorithms in Iterative Decoding of Turbo Codes, TDA Progress Report 42-124, NASA Code 315-91-20-20-53; hereinafter referred to as “Benedetto”). This rejection is respectfully traversed below.

Claims 4, 5, and 15-24 depend from claim 1, and claims 28, 29, and 39-48 depend from claim 25. Thus, claims 4, 5, 15-24, 28, 29, and 39-48 include all the limitations of claim 1 or claim 25. Based on the foregoing discussion regarding Van Stralen with respect to claims 1 and 25, it is maintained that claims 4, 5, 15-24, 28, 29, and 39-48 should be allowable over Van Stralen. Further, Benedetto was indicated as teaching comparison of absolute values according to the outcome of comparison of likelihood computations. Therefore, Van Stralen and Benedetto, individually or in combination, fail to teach or suggest the decoder and the decoding method of claims 4, 5, 15-24, 28, 29, and 39-48.

Based on the foregoing discussion, it is submitted that claims 4, 5, 15-24, 28, 29, and 39-48 are not rendered obvious by the teachings of Van Stralen and Benedetto. Accordingly, it is submitted that the Examiner's rejection of claims 4, 5, 15-24, 28, 29, and 39-48 based upon 35 U.S.C. §103(a) has been overcome by the present remarks and withdrawal thereof is respectfully requested.

§ 103 Rejection of Claims 6, 9, 10, 12, 13, 30, 33, 34, 36, and 37

In Section 10 of the Office Action, the Examiner has rejected claims 6, 9, 10, 12, 13, 30, 33, 34, 36, and 37 under 35 U.S.C. §103(a) as being unpatentable over Van Stralen and Benedetto in view of XP-000888685 ("Simplified Log-Map Algorithm", Research Disclosure, Kenneth Mason Publications, Hampshire, GC, No. 421, May 1999, Page 612, ISSN: 0374-4353; hereinafter referred to as "XP-000888685"). This rejection is respectfully traversed below.

Claims 6, 9, 10, 12, and 13 depend from claim 1, and claims 30, 33, 34, 36, and 37 depend from claim 25. Thus, claims 6, 9, 10, 12, 13, 30, 33, 34, 36, and 37 include all the limitations of claim 1 or claim 25. Based on the foregoing discussion regarding Van Stralen and

Benedetto with respect to claims 1 and 25, it is maintained that claims 6, 9, 10, 12, 13, 30, 33, 34, 36, and 37 should be allowable over the combination of Van Stralen and Benedetto. Further, it was indicated that document XP-000888685 teaches  $B=4=2^2$ . Therefore, Van Stralen, Benedetto, and document XP-000888685, individually or in combination, still fail to teach or suggest the decoder and the decoding method of claims 6, 9, 10, 12, 13, 30, 33, 34, 36, and 37.

Based on the foregoing discussion, it is submitted that claims 6, 9, 10, 12, 13, 30, 33, 34, 36, and 37 are not rendered obvious by the teachings of Van Stralen, Benedetto, and XP-000888685. Accordingly, it is submitted that the Examiner's rejection of claims 6, 9, 10, 12, 13, 30, 33, 34, 36, and 37 based upon 35 U.S.C. §103(a) has been overcome by the present remarks and withdrawal thereof is respectfully requested.

#### Conclusion

In view of the foregoing, entry of this amendment, and the allowance of this application with claims 1-48 are respectfully solicited.

In regard to the claims amended herein and throughout the prosecution of this application, it is submitted that these claims, as originally presented, are patentably distinct over the prior art of record, and that these claims were in full compliance with the requirements of 35 U.S.C. §112. Changes that have been made to these claims were not made for the purpose of patentability within the meaning of 35 U.S.C. §§101, 102, 103 or 112. Rather, these changes were made simply for clarification and to round out the scope of protection to which Applicant is entitled.

PATENT  
Serial No. 09/876,742  
Attorney Docket No. 450100-03274

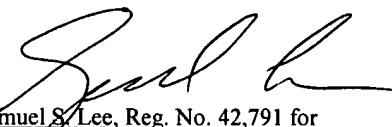
In the event that additional cooperation in this case may be helpful to complete its prosecution, the Examiner is cordially invited to contact Applicant's representative at the telephone number written below.

The Commissioner is hereby authorized to charge any insufficient fees or credit any overpayment associated with the above-identified application to Deposit Account 50-0320.

Respectfully submitted,

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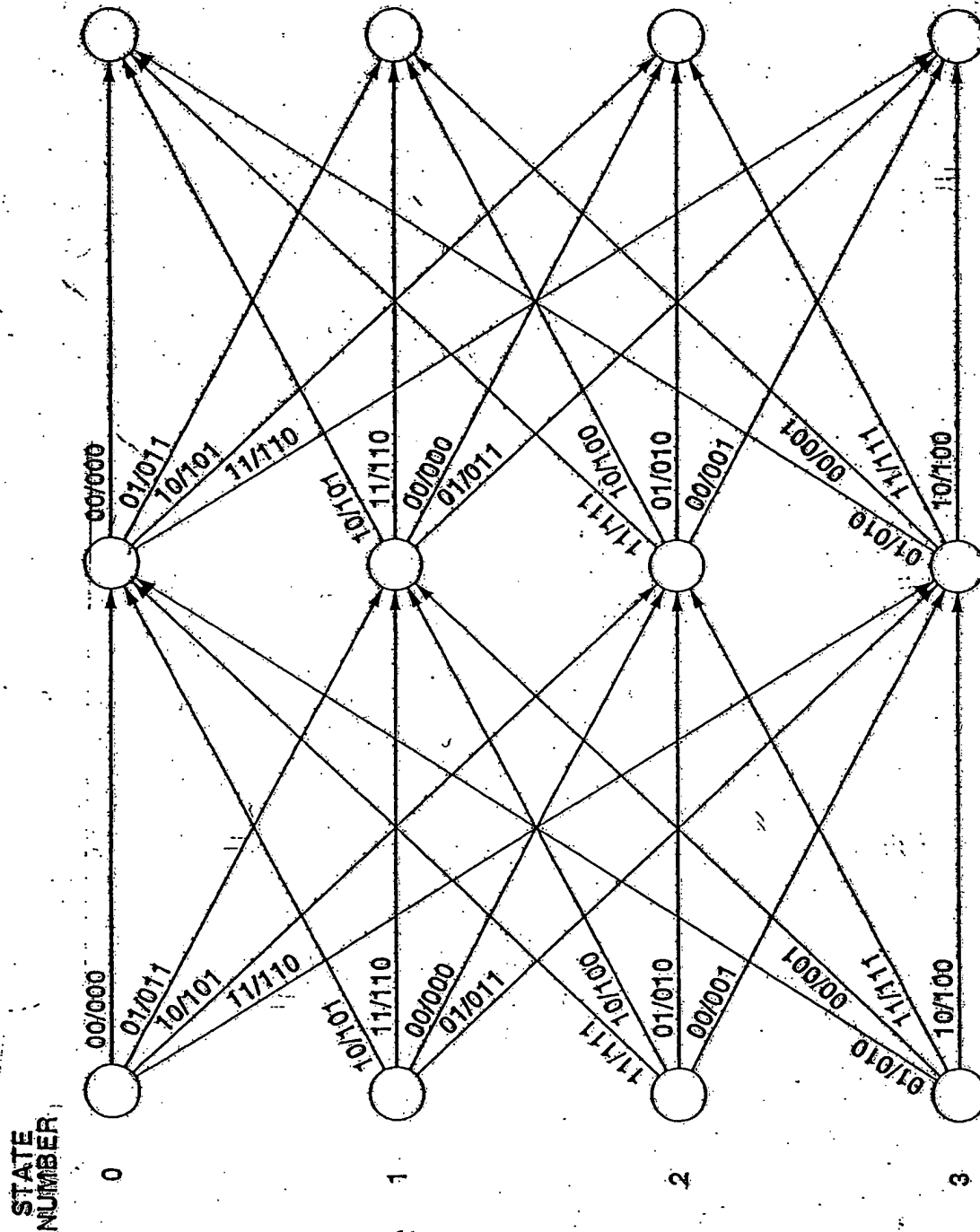
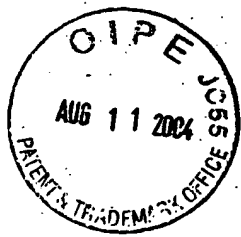


FIG. 8

(PRIOR ART)

legend added